In the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Previously Presented) A method of performing a Fast Fourier Transform in a data processing apparatus having a data cache smaller than the data set of the Fast Fourier Transform, comprising the steps of:

dividing said input data into R continuous data sets where each of said R continuous data sets fit within the data cache;

disposing said input data into memory, each R continuous data set in continuous memory locations with a space in memory locations from an end of one continuous data set to a beginning of a next continuous data set equal to the size of a cache line;

separately and independently performing a first stage radix-R butterfly computations on all the the R continuous data sets thereby producing R independent intermediate data sets each of which fits within the data cache; and

successively performing second and all subsequent stage butterfly computations on each independent intermediate data set in turn producing corresponding output data.

2. (Canceled)

3. (Original) The method of claim 1, wherein:

said radix-R is radix-2.

4. (Original) The method of claim 1, wherein:

said radix-R is radix-4.

5. (Canceled)

6. (Previously Presented) The method of performing an N-point radix-R Fast Fourier Transform in a data processing apparatus having a data cache comprising the steps of:

comparing the data set of input data and twiddle factors with the size of the data cache;

if said data set is smaller than said data cache, performing said Fast Fourier Transform in $\log_R N$ stages on all the data set in one pass; and

if said data set is larger than said data cache but smaller than R times the data cache

dividing said input data into R continuous data sets where each of said R continuous data sets fit within the data cache;

disposing said input data into memory, each R continuous data set in continuous memory locations with a space in memory locations from an end of one continuous data set to a beginning of a next continuous data set equal to the size of a cache line;

separately and independently performing a first stage radix-R butterfly computations on all the the R continuous data sets thereby producing R independent intermediate data sets in a first pass each of which fits within the data cache; and

successively performing second and all subsequent stage butterfly computations on each independent intermediate data set in turn producing corresponding output data in second passes.

7. (Original) The method of claim 6, wherein:

said Fast Fourier Transform uses complex input data and complex twiddle factors of M bytes each; and

said step of comparing the data set with the size of the data cache compares the data cache size to 4 N×M bytes.

8. (Original) The method of claim 6, wherein:
said radix-R is radix-2.

9. (Original) The method of claim 6, wherein:
said radix-R is radix-4.

10. (Canceled)

11. (Original) The method of claim 6, further comprising:
if said data set is larger than R times the data cache
performing I initial stages of radix-R butterfly computations on all the input data producing R independent intermediate data sets, where I is the next integer greater than $\log_R(D/C)$, D is the size of the data set and C is the size of the cache; and
successively performing all subsequent stage butterfly computations on each independent intermediate data set in turn producing corresponding output data in second passes.